African Virtual University

Education: Education EDU14

EDUCATIONAL RESEARCH

Ridwan Mohamed OSMAN

Foreword

The African Virtual University (AVU) is proud to participate in increasing access to education in African countries through the production of quality learning materials. We are also proud to contribute to global knowledge as our Open Educational Resources (OERs) are mostly accessed from outside the African continent. This module was prepared in collaboration with twenty one (21) African partner institutions which participated in the AVU Multinational Project I and II.

From 2005 to 2011, an ICT-integrated Teacher Education Program, funded by the African Development Bank, was developed and offered by 12 universities drawn from 10 countries which worked collaboratively to design, develop, and deliver their own Open Distance and e-Learning (ODeL) programs for teachers in Biology, Chemistry, Physics, Math, ICTs for teachers, and Teacher Education Professional Development. Four Bachelors of Education in mathematics and sciences were developed and peer-reviewed by African Subject Matter Experts (SMEs) from the participating institutions. A total of 73 modules were developed and translated to ensure availability in English, French and Portuguese making it a total of 219 modules. These modules have also been made available as Open Educational Resources (OER) on oer.avu.org, and have since then been accessed over 2 million times.

In 2012 a second phase of this project was launched to build on the existing teacher education modules, learning from the lessons of the existing teacher education program, reviewing the existing modules and creating new ones. This exercise was completed in 2017.

On behalf of the African Virtual University and our patron, our partner institutions, the African Development Bank, I invite you to use this module in your institution, for your own education, to share it as widely as possible, and to participate actively in the AVU communities of practice of your interest. We are committed to be on the frontline of developing and sharing open educational resources.

The African Virtual University (AVU) is a Pan African Intergovernmental Organization established by charter with the mandate of significantly increasing access to quality higher education and training through the innovative use of information communication technologies. A Charter, establishing the AVU as an Intergovernmental Organization, has been signed so far by nineteen (19) African Governments - Kenya, Senegal, Mauritania, Mali, Cote d'Ivoire, Tanzania, Mozambique, Democratic Republic of Congo, Benin, Ghana, Republic of Guinea, Burkina Faso, Niger, South Sudan, Sudan, The Gambia, Guinea-Bissau, Ethiopia and Cape Verde.

The following institutions participated in the teacher education program of the Multinational Project I: University of Nairobi – Kenya, Kyambogo University – Uganda, Open University of Tanzania, University of Zambia, University of Zimbabwe – Zimbabwe, Jimma University – Ethiopia, Amoud University - Somalia; Université Cheikh Anta Diop (UCAD)-Senegal, Université d' Antananarivo – Madagascar, Universidade Pedagogica – Mozambique, East African University - Somalia, and University of Hargeisa - Somalia

The following institutions participated in the teacher education program of the Multinational Project II: University of Juba (UOJ) - South Sudan, University of The Gambia (UTG), University of Port Harcourt (UNIPORT) – Nigeria, Open University of Sudan (OUS) – Sudan, University of Education Winneba (UEW) – Ghana, University of Cape Verde (UniCV) – Cape Verde, Institut des Sciences (IDS) – Burkina Faso, Ecole Normale Supérieure (ENSUP) - Mali, Université Abdou Moumouni (UAM) - Niger, Institut Supérieur Pédagogique de la Gombe (ISPG) – Democratic Republic of Congo and Escola Normal Superieur Tchicote – Guinea Bissau

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Production Credits

This second edition is the result of the revision of the first edition of this module. The informations provided below, at the exception of the name of the author of the first edition, refer to the second edition.

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AVU Multinational Project II funded by the African Development Bank.

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Introduction

I. Educational Research

II. Prerequisite Courses or Knowledge

In order for you to get the best out of this course, you will need to have basic university entry qualifications (e.g. secondary school certificate, diploma) and basic computer and internet skills. You will also need basic knowledge in statistics and use of data analysis computer programmes like excel and SPSS.

III. Time

You will need a total of 120 hours to complete this module. Below is a breakdown of the time you will need to spend on each unit;

Unit 1: 20 Hours

Unit 2: 30 Hours

Unit 3: 30 Hours

Unit 4: 40 Hours

IV. Materials

I suggest that you acquire a sample of educational research reports and proposals to enable you master the content of this module. You will need a computer with Internet connection.

V. Module Rationale

Good educational theory and practice rest on a strong foundation of new knowledge. Through research we can create new knowledge and/or even modify existing knowledge. In order to be effective, teachers need to test their methods of teaching and improve them in case they are not effective. In addition, most education systems in the world base educational policy on empirical investigations and quite often teachers are invited to participate in these investigations, which have contributed to their professional growth and improvement in their incomes. Therefore teachers need to have good research skills.

In this module you will learn how to identify research problems, write a plan to study the problems, execute this plan and generate useful knowledge and practical recommendations to solve educational problems. You will also learn how to critique other people's researches and to communicate and justify your approaches to a problem and conclusions. The module will also equip you with skills of compiling and writing your assignments. In addition you will also become a more open -minded and analytical thinker, qualities that are indispensible for a modern teacher.

VI. Content

6.1 Overview

This module introduces you to the theoretical and practical knowledge and skills you need in order to conduct simple educational research. You will develop skills in problem identification, conducting literature searches, writing research proposals, collecting and interpreting data and finally writing research reports. The module consists of the following units:

Unit 1

Research Concepts and Paradigms: Discusses the major research concepts and paradigms that research theory and practice rest on.

Unit 2

The Research Process: Discusses in detail the process of doing educational re- search and the steps involved.

Unit 3

Data Collection and Analysis: Discusses the techniques that are used to collect and analyse data.

Unit 4

The Research Project: Presents the process of writing a research report after going through the preliminary stages of the research process.

6.2 Course Outline

Unit	Expected time	Sub-topics
Unit 1: Research concepts and paradigm	20 hours	• The concept of educational research • Educational research paradigms • Aims of educational research • Types of educational research
Unit 2: The research process		Research process Identifying research problems Formulating questions and hypotheses Conducting literature searches Research designs

Unit 3: Data Collection and Analysis	30 hours	Constructing data collection Instrument Questionnaires Interview Guides Observation guides Documentary analysis • Data analysis techniques o Quantitative analysis • Descriptive statistics
Unit 4: Research Project	40 hours	• Planning research projects • Writing a research proposal • Writing a research report • Dissemination of findings

VII. General objectives

By the end of this module you should be able to;

- Demonstrate why and how we conduct educational research
- Identify, formulate and define research problems and questions
- Identify, locate and critically analyse research reports and proposals in the field of education and other related areas.
- Evaluate and write clear research proposals and reports
- Collect and perform both quantitative and qualitative data analysis

6.3 Graphic Organizer

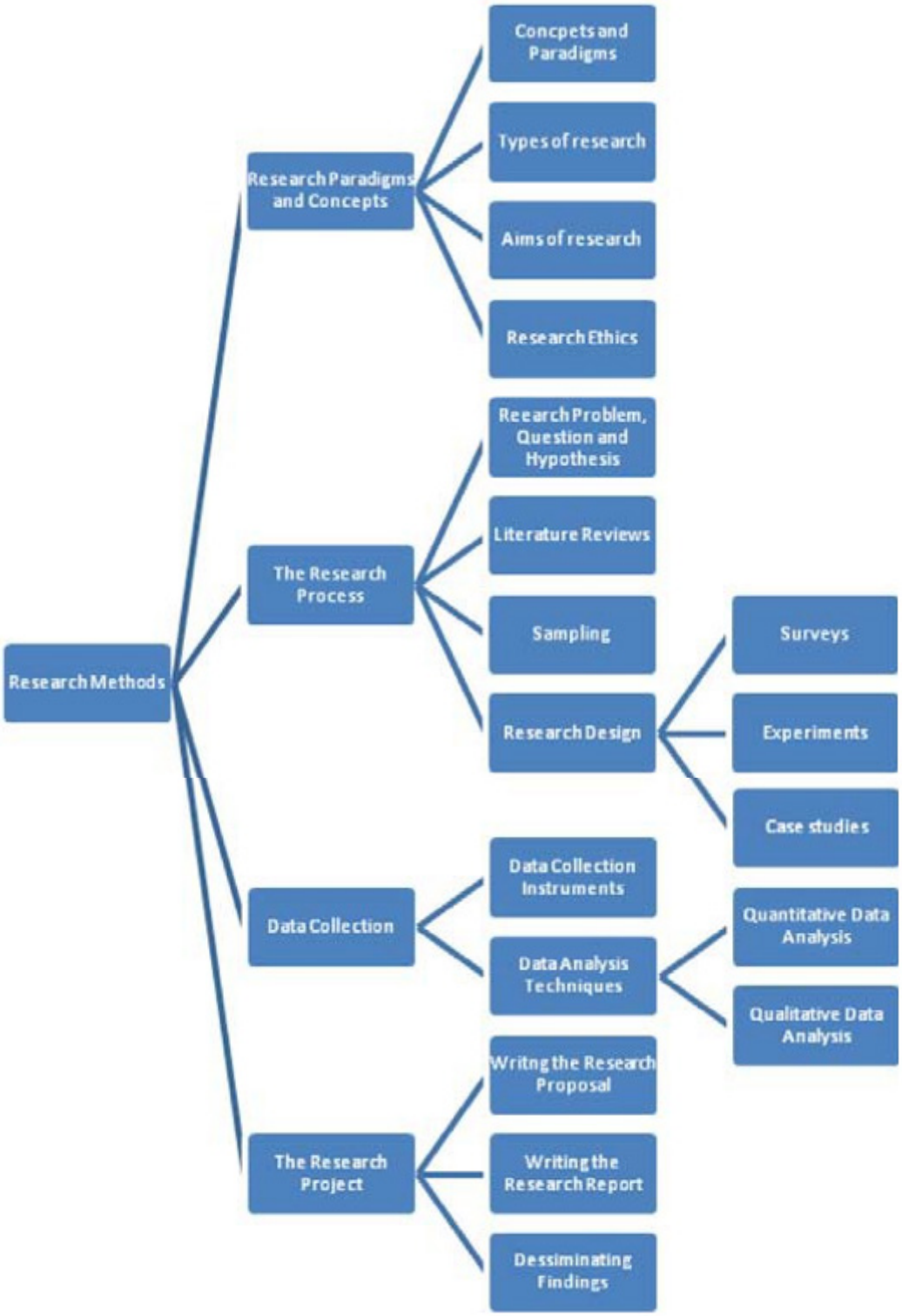

Figure 1 Module Graphic Organizer

VIII. Specific learning objectives

No.	Unit	Specific Learning Objectives
1	Research concepts and paradigms	At the end of this unit you should be able to: Describe the different philosophical paradigms underlying educational research Explain the meaning and purpose of educational research (explanation, pre- diction, control, creating knowledge) evaluate various types of research and classify research by its purpose and methods Explain the importance research ethics and its underlying principles
2	The research process	At the end of this unit you should be able to: identify researchable educational problems define and refine educational issues as research problems link the predictors/causes of the problem (independent variable) with dependent variables to generate hypotheses Differentiate quantitative research, qualitative research and mixed- method research approaches identify, locate and critically analyse documents containing information related to the research problem Conduct a literature search from electronic data bases like (ERIC, JSTOR, Dissertation Abstracts International) and the Internet write an effective literature review analyse research designs and be able to determine appropriate designs expound on sampling and appropriate sampling strategies

3	Data collection and analysis	At the end of this unit you should be able to: Identify appropriate data analysis techniques Construct appropriate data collection tools Use qualitative data analysis methods (managing, making meaning and presenting data) Use quantitative data analysis methods (graphic representation ,using measures of central tendency, variability, relation- ships, relative position, including nor- mal distributions and standard scores to analyse research data use computer programmes like Micro- soft Excel or SPSS to analyse data
4	Research Project	At the end of this unit you should be able to: Create an outline for a research proposal by; State the problem and identify the variables Develop the hypothesis Create the research questions Determine the scope of the study (including limitations) Identify relevant literature Describe the research methodology Identify and operationalize research variables, research populations and sampling Select appropriate data collection techniques (interviews, questionnaires, observation, surveys, content analysis) Use the APA referencing style to cite sources of information explain principles of copyright and intellectual property Incorporate Ethical standards in your proposals and reports Plan and conduct a pilot study Determine the reliability and validity of your research instruments Write effective project reports

IX. Teaching and learning activities

These multiple-choice, pre-assessment questions are designed to test what you already know about the issues covered in this module.

9.1 Rationale

Effective learning depends on what you already know about the subject before you attempt to master new learning material. This pre- assessment will assess your current level of knowledge on educational research. Answering these questions correctly or otherwise will be a good indication of your grasp of the subject matter covered in this module and what you will need to know to conduct educational research more effectively. It will prepare you mentally for the course and will assist your teacher to know the areas where to place more emphasis.

9.2 Questions

In each of the following questions choose the best answer out of the given options.

1. Which of the following is the correct sequence of the steps involved in the process of educational research?

a) Problem, design, data collection, Interpretation, report

b) Proposal, questionnaires, interpretation, discussion, report

c) Report, Problem, literature review, methodology, findings,

d) Literature review, methodology, problem, report, findings

2. Descriptive research design is used to answer research questions that involve

a) What is

b) Why

c) How

d) All

e) None

3. Cross-sectional studies involve

a) Collecting data at one point in time

b) Collecting data from the same population two or more times

c) Following a specific sample of individuals over a period of time

d) All

4. The main situation in which the researcher will use a causal-comparative research design rather than an experimental design is when

a) Random sampling is not possible

b) Experimental manipulation is not possible c.

c) Use of standardized tests is not possible

d) Young children are the subject of the research

5. In an experimental research design, random assignment is used to recruit subjects for the

a) Experimental and control groups

b) Pre-test and post-test

c) Independent and dependant variables

d) All of the above

e) None of the of above

6. Which of the following is a nominal variable?

a) Intelligence

b) Weight

c) Hunger

d) Gender

7. In educational research, literature reviews serve to

a) Provide background of what has already been known on a topic

b) Acquaint the researcher with relevant theories, procedures and instruments

c) Identify relations, gaps and inconsistencies in literature d. Help develop a hypothesis to a research question

d) All of the above

e) None of the above

8. Which of the following is not a characteristic of case studies research?

a) Studies a phenomena deeply

b) Studies a phenomena in its natural context

c) Represents both the researchers' and participants' perspectives d. All of the above

d) None of the above

9. Which of the following sources of knowledge is most reliable?

a) Intuition

b) Research

c) Logical reasoning

d) Expert advice

10. Which of the following is not a characteristic of a positivist research paradigm?

a) Views social reality as existing independently

b) Studies large samples to make generalizations

c) Makes detailed verbal descriptions of what is studied

d) Primarily uses quantitative data analysis techniques

11. In research, the process of developing and refining abstract ideas is called

a) Operationalization

b) Conceptualization

c) Measurement

d) Testing

12. A tentative prediction or explanation of the relationship between two or more variables is called

a) Variable b) Theory

c) A hypothesis d)Research question

13. Which of the following questions best addresses the heart of validity?

a) Does the instrument measure what it is intended to measure?

b) Does the instrument record variations within subjects?

c) If repeated several times on the same subjects under the same conditions, will the instrument produce the same results?

d) Does it cover all aspects of the issue under study?

14. Reliability of an instrument refers to its

a) Degree of consistency

b) Degree of exhaustiveness

c) Accuracy

d) Objectivity

15. From our largely oral African society, the best method to collect demographic data from subjects is through

a) Face-to-face interview

b) Telephone interview

c) Questionnaire

d) Observation

16. Which of the following is not a characteristic of quantitative research?

a) It concerns numerical data

b) It is aimed at verifying theories and hypotheses

c) It is aimed at getting in-depth understanding of issues

d) Uses statistical techniques to analyse data

17. The average variation of a set of numbers from the mean is called?

a) Standard deviation

b) Variance

c) Z-score

d) Mean

18. Literature review helps a researcher to

a) Learn what has already been written on the subject

b) Generate hypothesis and arguments

c) See the gaps in existing knowledge

d) All the above

19. Which of the following is not an aim of a research proposal?

a) To give a clear plan for the researcher to follow

b) To act as admission to a programme of study

c) To seek research funding from donors

d) To present the findings of the research to the public

20. A researcher from the Faculty of Education, Amoud University, Somalia, wants to study the critical thinking skills of students in the university. In order to select a sample of students for his research, she obtains the list of all students in the university. She recruits participants for his research by selecting every fifth person in the list. Which sampling technique is this researcher using?

a) Simple random sampling

b) Systematic sampling

c) Stratified sampling

d) Convenience sampling

9.4 Answer key

1.	A	11.	B
2.	A	12.	C
3.	A	13.	A
4.	B	14.	A
5.	A	15.	A
6.	C	16.	C
7.	E	17.	A
8.	E	18.	D
9.	B	19.	D
10.	C	20.	B

9.5 Pedagogical Comment for Learners

This pre- assessment is based on your previous experiences in research and con- tent that you will study in the module. While you might not have done a re- search methodology course in your secondary school or diploma or certificate studies, research might not be entirely new to you. Probably you have had an opportunity to participate in research as a respondent or data collection assistant. Though you might not have done a formal research project, it is a fact that all of us are researchers at least in a naïve sense. We do research every day as we try to solve the problems we face in our daily lives. Therefore, if you scored less than 6 items correct, you need to study harder in order to achieve the basic objectives of this module. If you scored between 7 and 13 items correct, it means you are ready to embark on the module immediately. A score greater than 13 items correct implies that you have a solid knowledge foundation to en- able you complete the module with ease.

X. Key Concepts (Glossary)

1. **Action Research:** is aimed at solving immediate educational problems that teachers and students face. The findings from applied research help us make practical decisions about specific problems.
2. **Case study:** the in-depth study of instances of phenomena in its natural context and from the perspective of the participants involved in the phenomena
3. **Conceptual Framework:** A series of ideas or concepts connected by statements about the relationships that exist among them.
4. **Educational research:** This is research done with the aim of improving and implementing educational theory and practice.
5. **Focus Group:** A discussion conducted by the researcher with a group of research participants focusing on a particular issue).
6. **Literature review:** The identification and analysis of literature and information related to what is to be or has been studied.
7. **Longitudinal study:** Any research that follows up a particular individual group over a time , measuring changes in the issue of interest.
8. **Methodology:** The procedures used in research to create new knowledge.
9. **Paradigm**: A system of practice and thinking, which defines for researchers the nature of the problem they are studying and the correct ways of going about the study.
10. **Positivism:** A research paradigm concerned with gathering information in an objective way by making use of quantitative measurements.
11. **Research Problem:** An interrogative sentence or statement that asks: what relationship exists between two or more variables?
12. **Problem Statement:** A research question or a statement about the purpose of the Study.
13. **References:** All of the Literature used in writing the research Article, containing mostly recent and Primary Sources. Written following a format e.g. APA (American Psychological Association) Format

XI. Compulsory readings

Reading #1

Title: Mixed Methods Research:

A research Paradigm Whose Time HasCome

URL address: http://www.tc.umn.edu/~dillon/CI%208148%20Qual%20Research/Session%2014/Johnson%20&%20Onwuegbuzie%20PDF.pdf

Date last visited: 16/04/2016

Abstract

The article presents an explanation and justification for the third alternative approach to research. It also revisits the two common approaches to research (qualitative and quantitative) and their underlying paradigms. This article proposes the third alternative approach, mixed methods research, and the philosophical paradigm it rests on, namely pragmatism. First, the article, explains how the two approaches complement each other. Then, it highlights the weaknesses and strengths of each. The author finally gives the advantages of mixed methods research, and discusses its fundamental principles and how it can be used.

Rationale

The article shows students both the strengths and weaknesses of the quantitative and qualitative research. It helps them understand the need for multi-method research and the fruits we can enjoy from such endeavour.

Reading #2

Title: Ethics of Educational Research: An agenda for discussion

URL address: http://www.socialresearchjournals.com/archives/2016/vol2issue3/2-3-19.pdf

Date last visited: 16/04/2016

Abstract

This paper discusses the issues that lie at the heart of ethics in educational research including the key principles of ethics in educational research, the author discusses how to implement these principles in order to reduce the risks human subjects may face.

Reading #3

Title: Ethical Issues in Qualitative Research: What would you do?

URL address: http://uk.sagepub.com/sites/default/files/upm-binaries/27011_4.pdf

Date last visited: 16/04/2016

Abstract

This article discusses the ethical behaviour, ethical principles as well as ethical issues one faces in educational qualitative re-search. The article reflects the experiences of a researcher as he conducted a qualitative research on students in a special needs education program. The challenges the researcher faced clearly reveal the issues of informed consent, confidentiality and individual realities.

Rationale

The article provides a short, but comprehensive, synthesis of the challenges ethical dilemmas pose to research. With its real examples, it will give students an understanding of the basic concepts underlying research ethics. It will also give them a framework for designing solutions to ethical dilemmas in research.

Reading #4

Title: What is Ethics in Research & Why is It Important?

Complete reference: http://www.niehs.nih.gov/research/resources/bioethics/whatis/

Date last visited: 16/04/2016

Abstract

This reading gives a detailed analysis of the most important research ethics principles that apply to both qualitative and quantitative research. It further shows how a researcher can infuse ethics in the research and how to resolve ethical dilemmas during the research process. This article has several case studies on ethics in research.

Rationale

The reading will help students understand how to identify and respect research ethical standards. It will also help them learn how to resolve ethical issues that might arise during the research process.

Reading # 5

Title: Research paradigms

Complete reference: http://uir.unisa.ac.za/bitstream/handle/10500/4245/05Chap%204_Research%20methodology%20and%20design.pdf

Date last visited: 16/04/2016

Abstract

It is often a challenge for a researcher to determine the most appropriate paradigm for his research question. This reading introduces the concept of paradigms and explains in more detail both qualitative and quantitative research paradigms. It shows the importance of working within a specific paradigm and how to determine a paradigm that suits a research question.

Rationale

This article will give students ideas on how to select an appropriate paradigm for their research questions.

Reading #6

Title: APA citation and referencing style (5th and 6th edition)

Complete reference: http://owll.massey.ac.nz/referencing/apa-5th-vs-6th-edition.php

Date last visited: 16/04/2016

Abstract

This reading shows how to cite sources of information that a researcher has consulted with. It shows the formats we must follow when citing internet articles, journals, and electronic data bases. It further shows how to write research journal article. The reading also explains in great detail how to write a reference page for your proposal, course work assignment or research report.

Rationale

This reading acts as a guideline for students in relation to citation and referencing when writing assignment papers and research proposals and reports.

Reading #7

Title: What is Research Design?

Complete reference: https://www.nyu.edu/classes/bkg/methods/005847ch1.pdf

Abstract

Date last visited: 16/04/2016

The reading introduces the concept of research design. It discusses in detail types of research designs. It shows the importance of following a particular design in a research process. It further explains the characteristics of good research designs.

Rationale

This reading will enable student select research designs that suit their research questions. It will further enable them to choose between qualitative and quantitative designs. The reading also shows how to select a sample that is appropriate for the design specified design selected.

Reading #8

Title: Sampling In Research

Complete reference: http://study.com/academy/lesson/

what-is-sampling-in-research-definition-methods-importance.html

Date last visited: 16/04/2016

Abstract

This reading gives detailed explanations of major sampling concepts. It highlights some important factors that the researcher must consider when selecting a sample that suits the needs of the research objectives to be achieved. It contrasts qualitative and quantitative sampling techniques.

Rationale

The reading will help students learn basic concepts in sampling, the importance of sampling and how to select an appropriate sample.

Reading # 9

Title: Developing Data Collection Instruments

Complete reference: http://siteresources.worldbank.org/NUTRITION/Resources/Tool8-chap8.pdf

Date last visited: 16/04/2016

Abstract

This reading gives a detailed description of both quantitative and qualitative data collection instruments. It gives tips on how to construct data collection instruments and how to make sure that instruments are reliable and valid.

Rationale

The reading will help students learn how to design data collection instruments. It will also enable them acquire skills of ensuring that data collection instruments are reliable and valid.

Reading #10

Title: Scholarly Research and Related Resources: Writing Tips/Presentation

URL address: http://libguides.wits.ac.za/c.php?g=145381&p=952655

Date last visited: 16/04/2016

Abstract

This cite has numerous articles writing tips .The articles discusses in detail how to write a research reports in a scholarly manner, conforming to laid down guidelines. It gives a step-by-step description of the writing and presentation process.

Rationale

This articles will help students develop the skills of writing research papers and own assignments according to the standards of APA.

XII. Useful links

Link #1

Title: The Dummy's Guide to Data Analysis Using SPSS

URL: http://www.aitrs.org/EchoBusV3.0/SystemAssets/Documents/program2012/entro%20sampling/lecture5.PDF

Date last visited: 16/04/2016

Description

The link provides an online version of the SPSS called Dummy's Guide. The guide will help students understand and master the skill of analysing quantitative data with the aide of SPSS. It also exposes students to some statistical concepts that would be helpful as they advance in the realm of educational research.

Link #2

Title: Educational Resources

URL: http://www.eric.ed.gov/

Description

This link provides a large number of educational research articles and other re- sources that would be helpful to you as you proceed in this module and later in your career as a teacher.

Link 3

Title: Introduction to research

URL: http://en.wikibooks.org/wiki/Research_Methods

Description

This article gives a comprehensive introduction to research. It will be of great use to you as a beginning researcher, since you are now getting the basic concepts of educational research.

XIII. Learning activities

Learning activity # 1

Title of learning activity: Research Concepts and Paradigms

Summary of the learning activity

In this activity you will be introduced to important research concepts and paradigms. When you complete the activity you should be able to explain the meaning and purpose of educational research (explanation, prediction, control, creating knowledge) , Identify various types of research and classify educational research by its purpose and methods and also be able to explain the importance of research ethics.

Objectives

By the end of this activity, you should be able to

- define research
- Explain the Characteristics of research
- Evaluate Research paradigms
- Analyze the Purpose of research
- Examine Types of research
- Identify Ethical issues of research

Key words

Theory

Epistemology

Positivism

Post-positivism

Quantitative research

Qualitative research

Research ethics Informed consent Confidentiality

Anonymity

Plagiarism

Codes of conduct

List of relevant reading materials

Reading #1

Title: Fundamental Characteristics of Research

URL address: http://evaluation.wmich.edu/JMDE/content/JMDE-005content/PDFs_JMDE_005/Definitions_of_Research.pdf

Date Retrieved 16/04/2016

Abstract

The article answers an important question "What is research?" Researchers have adopted various definitions of research. This has resulted in widespread confusion about what actually constitutes research. In this article, the author discusses the features of research, derived from a definition he considers as commonly used – "research is a truth-seeking activity which contributes to knowledge, aimed at describing or explaining the world, conducted and governed by those with high level of proficiency or expertise". The author also presents other definitions that add dimensions to the characteristics of research.

Rationale

The article gives students a broader understanding of what research is, its aims, principles and its most important features. It also helps them appreciate the different ways in which research can be defined.

Reading #2

Title: Ethics of Educational Research: An agenda for discussion

URL address: https://www.aub.edu.lb/fas/smec/Documents/Ethics_20of_20Educational_20Research_20hcb_20nov_202005.ppt.

Date Retrieved 16/04/2016

Abstract

This power point presentation discusses the issues that lie at the heart of ethics in educational research. First, it starts with a discussion of the underlying principles of educational research. Then, the presentation moves on to highlight the intricate relationship between research and ethics. It brings out the fact that the very nature of educational research involving human beings makes it an ethical venture. The paper discusses the risks that research participants may face if the research is conducted in a manner that does not comply with ethical standards. In addition, the presentation indicates the condition in which human participants are vulnerable to risks resulting from the conduct of research. On the basis of that discussion, the author argues for the need of rigid ethical standards that protect subjects from exploitation and harm. After showing the key principles of ethics in educational research, the author discusses how to implement these principles in order to reduce the risks human subjects may face.

Rationale

This presentation gives an in-depth discussion of what research ethics are and shows how researchers can infuse ethics in their researches.

Detailed Description of the activity

The aim of educational research is to develop new knowledge about teaching, learning and educational administration. This knowledge is of value because when applied it leads to the improvement of educational theory and practice. The quality of knowledge produced in educational research will depend on the type of research used and the philosophical paradigms it rests on.

The meaning of Research

For many beginning researchers, the word research conjures up in their minds a be-spectacled man wearing white coats, manipulating chemicals in a laboratory. However, the business of research is about finding new knowledge and solving problems (Nkpa, 1979). Solving problems is something that we do all day long–it is inherently a human activity. Therefore you are a researcher in your own right though you might have been doing it in a naïve way. Research is a systematic and objective activity of discovering knowledge to answer a certain question or solve a problem. Over the years, human beings have used a variety of techniques to find new knowledge. Some of these include; tradition, authorities, personal experience, intuition, trial and error, logical reasoning and scientific research. However, research is the most popular and preferred technique of discovering knowledge. This is because research is formal and the process can be replicated.

The Research Process

The Research Process is a step-by-step information skills framework that improves student metacognition by making the learning process explicit.

Why a process?

Information skills are not isolated incidents, but connected activities that develop a ways of thinking about and using information.

The steps of the Research Process are:

1. Initiate 2. Locate 3. Select 4. Organise 5. Present 6. Assess

Figure 1: The research process

NB. The process is not liner but may be interrelated

Aims of educational research

Educational research is conducted to:

- Explore, an educational problem, so as to make further research on it possible
- Explain, social life of learners and teachers by providing reliable, well documented information
- To evaluate human behaviour (student and teachers) and action in educational settings
- To evaluate social issues and their effect on learners and teachers
- To develop and/or test educational theories
- To improve educational practice through applied research

Formulating a research problem

Once the general topic or problem has been identified, It should then be stated as a clear research problem that is, taken from just a statement about a problematic situation to a clearly defined researchable problem that identifies the issues you are trying to address. It is not always easy to formulate the research problem simply and clearly. Many topics may prove too wide-ranging to provide a researchable problem. Choosing to study, does not in itself provide a researchable problem. Formulating the research problem allows you to make clear, both to yourself and the reader, what the purpose of your research is. Key questions shown in Figure 2 must be asked by the researcher when formulating the research problem.

Figure 2 : Key questions for formulating a research problem

In order to achieve the above aims, educational researchers do one or a combination of the following;

1. Description

Educational research in most cases involves the description of educational phenomena, in terms of its structure, activity, change over time, relationship to other phenomena and so on. Such studies have greatly improved our understanding of what happens in the classroom and its surroundings. Statistics produced by descriptive studies are usually of great interest to policy makers and educators.

2. Prediction

This involves the ability to predict a phenomenon that will occur at a time in the future from information that is available now. For example, students' aptitude tests, taken when students are to enrol in a college or university, are intended to predict students' future achievement in their studies. In education, we need to have tools for prediction because:

- It aids in the selection of students who will be successful in particular educational settings and/or programs.
- It is used to identify students who are likely to be unsuccessful in their education so that to prevent problems like dropout rate.

3. Improvement

This type of research knowledge concerns the effectiveness of interventions, such as instructional programs. Educational researchers have always wanted to discover new and more effective means of improving student achievement, thinking ability, learning facilitation, study skills etc.

4. Explanation

This is the most important of all research knowledge. It means describing an educational phenomenon, predicting its consequences, and knowing how to intervene to change these consequences. Scientists frame their explanations as theories. A theory is an explanation of a certain set of phenomena in terms of a system of constructs and laws that relate these constructs to each other. For example, Jean Piaget proposed a theory of intellectual development after a period of research and observation. Most of the educational researches conducted in the classroom aim to explain phenomenon that is not well understood.

Research paradigms

A research paradigm is a view a researcher holds about the nature of knowledge (truth or reality). A paradigm has ontology, epistemology, and methodology (Kathuri & Pals 1993). Ontology refers to researchers' assumptions about the nature of reality. Epistemology is the researcher's assumptions about how to gain knowledge about reality. Methodology refers to the actual procedures used by researchers to explore reality. Some of the common paradigms used by researchers in education are;

Objective Reality (Positivism)

This is the assumption that features of the social environment have objective reality. This means that these features exist independently of the individuals who created them and who observe them. Researchers who hold such a view are called positivists. Positivists view reality as being 'out there' and available for study in a more or less static form. Positivism is the epistemological doctrine ascribed to, by natural sciences. Some of the major characteristics of positivism include;

- Belief that features of the environment retains a high degree of constancy across time and space.
- A search for what is generally true of the social environment.
- Defining a population and selecting a representative sample from the population for study.
- Attempts to generalize findings from the sample to the general population.
- Isolating features of the social environment and conceptualizing them as variables (that can take different values).
- These values can be expressed as numerical scales. i.e. educational achievement and class size.

However positivism is limited because, all features that are important to classroom instruction can't be quantified and operational definitions given to these variables may not have the same meaning in different settings.

Constructed Reality (Constructionism)

This is an opposing epistemological position to positivism based on the assumption that social reality is constructed by the people who participate in it. These constructions take the form of interpretations–the meanings ascribed to social reality. Features of the environment are not considered to have existence apart from the meanings that individuals construct for them. Researchers who hold this view are called positivists or constructionists. They believe that the scientific inquiry must study multiple social realities created by different individuals as they interact in a social environment. Post-positivism is the epistemological doctrine that social reality is constructed and that it is constructed differently by different people.

Interpretative paradigm (Interpretsim)

This is the belief that the study of individuals' interpretations leads to understanding reality. Interpretative researchers seek for subjective experiences and en- gage respondents in a natural and empathic manner. So they focus their studies on specific cases. Findings from such research can't be generalized to whole populations. Generalizations must be made on a case-by-case basis. Interpretative researchers;

- Focus their study on individual cases and make detailed verbal descriptions of what they observe.
- Their data analysis also is primarily verbal rather than statistical.
- However, Interpretative research has the following drawbacks
- The words and form of speech used to interview an individual may not have the same meaning for the informant as for the researcher.
- The same words used by different individuals may have different meanings.

Types of Educational research

Types of research emerge as a result of the kind of information the researcher wants to collect and the questions he wants to answer and the paradigm that he holds. Researchers normally want to answer three basic questions; 1) how can a problem be solved? 2) What really happens when a given condition or problem exists? and 3) why do some problems or conditions occur?. Let us think about these problems to help us understand the three questions above. Imagine that you and your fellow teachers have realized that the school compound is littered with garbage thrown by students and the school is becoming unhygienic. You decide to conduct a research on how this garbage problem can be solved; you involve students in generating a solution to this problem. You will then have sought to answer the HOW question. Think about this second problem; you realize that on many occasions about ten students in your class have come to school with wounds on their bodies. An interview with some of them indicates that they are being physically abused by their parents. When you conduct a research to understand their real experiences at home, this research project will answer the WHAT question. Suppose you decide to conduct research to find out why many students in your class sleep during mid - morning lessons, the re- search project will seek to answer the WHY question. Now that we have known how types of research come about, let us examine the types used by educationists and other researchers in more detail.

1. Quantitative; research is grounded in the assumption that features of the social environment constitute an independent reality and are relatively constant across time and settings. So they can be measured or quantified accurately using structured instruments such as questionnaires, psychometric tests or tools like the lie detector. Quantitative research is positivist. Quantitative researchers develop knowledge by collecting numerical data on observable behaviours of samples and then subjecting these data to numerical analysis.

2. Qualitative; research is grounded in the assumption that features of the social environment are constructed as interpretations by individuals and that these interpretations tend to be transitory and situational. This type of research is interpretive, though it can also be

Post-positivist. Qualitative researchers develop knowledge by collecting primarily verbal data through the intensive study of cases and then subjecting this data to analytic induction. The table summarises the major differences between qualitative and quantitative research.

	Quantitative Research	Qualitative Research
Data generated	Numerical(quantitative) data	Verbal, text and pictorial
		(qualitative) data
Nature of reality	Assumes an objective (measurable) social reality	Assumes constructed social reality
Nature of causal relationship	Views causal relationship among social phenomena from a mechanistic perspective	Assigns human intentions a major role in explaining causal relationships among social phenomena
Type of reasoning	Inductive .Uses, preconceived concepts and theories to determine what data will be collected	Deductive Discovers concepts and theories after data has been collected
Purpose	Discovery	Confirmatory
Nature of research	Focused In-depth Known variable	Holistic
	Established guidelines Statistical design Context free.	Shallow

Subjects studied	Representative sample	Informative cases
Data analysis method	Statistical methods (Descriptive or inferential).	Analytic induction. Narrative, Inquiry.
Generalizing of findings	Findings Generalizable from sample to a defined population	Findings Generalizable from case to similar case
Stance of research	Objective and detached	Personally involved
Research report	Impersonal and objective	Interpretive and subjective

However research can also be classified according to aims and methods used. Educational research can be classified into a number of categories.

Classification on the basis of aims

Researches have different aims, and based on their aims, they can be classified either into basic or applied;

3. Basic research; collects and uses empirical data to formulate new theories or expand existing ones. The aim of this research is to generate new knowledge. The utility of the findings is usually beyond the scope of basic research.

4. Applied research; is aimed at solving immediate educational problems that teachers and students face. The findings from applied research help us make practical decisions about specific problems.

Classification of research on the basis of method of investigation

Research can also be classified on the basis of the methods it uses to investigate the research problem. Under this classification, the following categories exist.

5. Experimental research

In experimental research, the researcher studies cause-effect relationships between variables by manipulating and controlling the variables.

6. Ex post facto research

This research is used when the investigator in unable to manipulate or control the variables involved in a causal relationship. In real life, it is not possible to control the amount of independent variables one is exposed to, and to assign subjects to different types of

treatments. Ex post facto research is suitable in this respect. For example if a research wants to explore the experience of plane crush survivors, there is no way she can organise a plane crush before the study. The only viable alternative is to study respondents who have been already involved in a plane crush.

7. Descriptive research

Descriptive research is intended to understand the existing conditions or status quo of an educational phenomenon. It is used to determine 'what is'. Unless researchers generate accurate description of the phenomena under study, they lack firm basis for explaining or changing it.

Principles of Educational Research

Modern research is expected to comply with certain standards, in order to make findings more generalizable and acceptable. They include the following:

- Precision in measurement: effort should be made to measure phenomenon accurately
- Replication: Other independent researchers should be able to produce similar findings
- Validity: measuring what is supposed to be measured
- Reliability: Measuring instruments and procedure should produce consistent results
- Objectivity: Research should be conducted without prejudice, bias, data presented as is
- Ethics: Ethical standards should be adhered to in the research process.

Please NOTE: The first five principles were derived from quantitative research, where measurement of phenomena and testing hypotheses is the main objective. However, even qualitative researchers today follow some of these standards al- though they might use different terms.

Ethics in research

This word 'ethics' might not be new to you. Teachers are expected to adhere to professional teaching ethics in their practice. Ethics is right behaviour that a per- son is supposed to show when performing specific duties. We also have ethical conduct related to research. The main purpose of research ethics is to protect the welfare and rights of respondents (Blanche & Durrheim, 1999). Researchers should always keep the following principles in mind.

a) Research participants must not be exposed to experiences that result in serious or permanent harm, or experiences they did not prepare for.

b) Individuals should not be deprived of their self-determination at any point in the research project.

c) The consent of the participants, usually in written form, should be secured

before they are recruited to take part in the study.

d) At the start of the project, participants should be told all the details of the project, including aims of the study, intended uses, role of data collector(s), the kind of treatment that they will be subjected to, etc.

e) Also, subjects should be given the promise that their names and the data they provide will not be known to people other than those closely involved in the project.

Activity: Listen to the following Video on Ethics in research

https://www.youtube.com/watch?v=BQeUuxIzsfU

The above video exposes you to ethical safeguards and benefits of doing ethical research. The video also outlines basic research principles

Learning activities

For you to successfully cover the content of the unit, please complete the activities below. The activities are presented in steps in order to enable you work them out easily.

Human beings are constantly seeking for new knowledge to solve their problems. A variety of methods have been tried, with varying degrees of reliability and validity. This is because we usually base our decisions on the information at our disposal.

Step1

Using the knowledge you have acquired above, answer the following questions:

- What are the most common sources of knowledge? List them.
- Which of them do you think is most commonly used in your community?
- Which of them do you normally rely on for new information? Why
- (Write a 100 words essay containing your answer)
- In the essay, identify the strengths and weaknesses of the sources you have listed.
- Fill out the following form summarizing what you have learned about sources of knowledge.

Source of Knowledge	Used in Community	I rely on this source of… (type of information)	Strengths	Weaknesses
1				
2				
3				
4				
5				
6				
7				

The superiority of research as a source of Knowledge

Scientific research is the most advanced and reliable source of knowledge. Generally, people from all kinds of professions accept research findings as being true and objective.

Step 2

- Study reading #1 and answer the following questions in an essay of about 300 words;
- What are the characteristics of research that make it more reliable and objective than the other sources of knowledge?

Step 3

Study reading #2 and use it to complete the table below.

Type of research	Major Assumptions	Strengths	Weaknesses
Quantitative			
Qualitative			
Mixed Methods			

Step 4

Educational researchers face a variety of ethical dilemmas when conducting re- search that involves human beings as its subjects. Therefore, researchers are sup- posed to adhere to the ethical principles as much as possible during the research process.

Study readings #3 and #4 and #5 and use the knowledge you have acquired to answer the questions below. Each of the scenarios below outlines a hypothetical research project.

- Study them carefully and write a 200-word essay addressing the following points.

1. What are the possible ethical violations the researcher can commit?
2. Can the study be done ethically?
3. What specific steps can be taken to minimize ethical violations?

1.Social interactions of disabled students. Elementary students with learning disabilities are generally less liked by their peers (and teachers) compared to their non-disabled counterparts. In an effort to investigate the reasons for this difference, an investigator proposes to videotape the social interactions of sixth grade disabled and non- disabled students. The videotaping takes place in a special research trailer that comes to the schools. During the videotaping, a pair of students plays a game together. Because the investigator believes that the presence of a video camera will substantially alter the way in which the students act, the investigator plans to conceal the camera from the students.

2. Drug use among high school students. In order to explore the effects of drug use on academic performance, an investigator intends to collect data concerning students who have either entered treatment for a drug-related problem or been convicted of a drug offense. The data will come from several sources. The investigator intends to request information from the students' schools, drug counsellor (if the student is in treatment) or parole officer or equivalent (if the student is under legal supervision), parents, and the student him/ herself.

3. Effects of lowered self-esteem on cognitive performance. The investigator seeks to examine the effects of a serious blow to self-esteem on subsequent cognitive performance. He or she first administers a personality inventory, and then leaves the room to «score» it. In fact, the scores are bogus and have been pre- arranged. Upon returning to the room, the investigator tells the participant that the personality inventory results suggest a particularly unappealing personality. In conclusion, the investigator asks «I don't suppose you have any friends, do you?» The participant then completes a series of cognitive tasks.

4. Group dynamics. The investigator is interested in the ways in which school administrators reach decisions. He or she assembles groups of 5 administrators and presents them with a typical problem in academic administration. The administrators' task is to reach an agreement as to how to solve the problem. The investigator explains that in order not to contaminate the situation, he or she will leave the room and simply record the interaction. Further, since it is important that the group composition remain constant and that they not be disrupted, if no one objects, he or she will lock the door and only allows them to leave after the session is over.

5. Cooperative learning among kindergarten students. A psychologist wants to study the how students learn how to cooperate in learning even when they are as young as nursery age. The researcher tells the students the aims of her research and what they will be required to do. The children enthusiastically accept her request. She devises some learning games for them to do in groups and tells them they need to help each other in the process of doing the activities. Then, her video tapes their discussion as they proceed on with the games.

Formative Assessment

a) The following is a list of researches that have been conducted on critical thinking. What is the aim of each and justify why you say so? Remember that some of the titles may have more than one aim.

i) Assessing university students' general and special critical thinking.

ii) Critical thinking among university students: Does family background matter?

iii) A look across four years at the disposition toward critical thinking among undergraduate students.

iv) Critical thinking predisposition among undergraduate athletics training students.

v) Courses and instructions affecting critical thinking

b) Assume you have organised a research project. Write a 500 word essay indicating the paradigm that you will follow and why. In the essay also indicate the ethical issues that you will address and why.

Learning activity # 2

Title of Learning Activity: The research process

Summary of the learning activity

Research begins with having an issue or idea to investigate, normally referred to as a problem.

Objectives

In this activity, you should be able to;

- to identify researchable educational problems,
- define and refine these problems,
- form relevant research questions and hypotheses.
- to conduct a literature search about the problem
- determine the appropriate research paradigm, design, and methodology for the research.

Key concepts

Item: A question or statement in a test or questionnaire to which a research participant is expected to give a response.

Literature review: The identification and analysis of literature and information related to what is to be or has been studied.

Methodology: The procedures used in research to create new knowledge.

Paradigm: A system of practice and thinking, which defines for researchers the nature of the problem they are studying and the correct ways of going about the study.

Research design: A frame work that guides research activities to ensure that sound conclusions are reached.

Sampling: Involves selection of specific research participants from the entire population.

Key words

- Research question
- Research problem
- Hypothesis
- Variable
- Literature search
- Literature review
- Sample
- Research design

Activity

Title: Research Methods

Title: Qualitative Research Methods for Social Science

Complete reference: https://mthoyibi.files.wordpress.com/2011/05/qualitative-research-methods-for-the-social-sciences__bruce-l-berg-2001.pdf

Detailed description of the activity

In this activity you will study relevant readings and do some activities that will enable you learn how to: Identify a research problem, form good hypotheses and research questions, Conduct a literature search and select appropriate units of study. The activity is divided into short steps so that it is easier for you to complete.

Content

Research is like building a house. Before you build a house, you need to have an idea of what it should look like – a blueprint. Then the draughtsman translates your idea into a plan that will be used by the builders. Also in research you need to have an idea of what you will research about before doing the actual research. The following steps can help you compose a clear picture of what you want to study.

Problem Identification

The research process begins with problem identification. A problem is a difficulty or occurrence that puzzles you. It is an issue of concern for which you want to seek a solution. A problem does not necessarily need to be a dangerous or a harmful situation; it can also be a mere lack of knowledge on a particular educational issue (Somekh, Lewin 2005). For example, if you find that your female students in secondary school get low scores in Mathematics compared to boys, and you feel the need to investigate the reasons why females' achievement in mathematics is lower than that of their male counterparts. In this example, this constitutes your research problem. Therefore, you may plan a study to find out the causes of this low achievement. After identifying your problem it is good to state it in a clear, simple way. This

is what we refer to as a problem statement. A problem statement is a sentence or statement that asks: what relationship exists between two or more variables. In the above example, achievement in mathematics is one variable while gender (female or female) is the other variable.

Learning tip

Not all problems are researchable. A problem is researchable if It can be solved through research. It is also not always easy for a researcher to formulate his problem simply, clearly and completely. However a good research problem expresses a relationship between the variables or issues of interest clearly in question form and implies possibilities of empirical testing.

Step 1

- Visit two teachers in your area and ask them to mention 5 issues related to education or teaching that they would wish to explore.
- Arrange the issues the teachers have identified into a priority list. You may use the questions below as a guideline to do this activity.
    - What is the issue?
    - Why is it a problem?
    - Who is (are) affected by this problem?
    - How widespread is the problem?
    - What are the predictors (causes) of the problem?
- Select the highest priority issue and write a 200 word essay giving reasons (a Minimum of 4) why you think it is a good research problem.

For the issue you selected to be appropriate for research, you should make sure that it conforms to the following criteria of researchable topic.

- The problem must be important
- It should also be interesting
- It must be feasible with respect to the given current situations
- It must be interesting

In the next step you will read more about the problem you have selected, so as you can have a better understanding of it, which will enable you state it more clearly.

Literature search

After you have identified your research problem, it is essential that you read about what other people have written about it. The knowledge you acquire helps you to define and refine the problem. This process is called a literature search or survey. When you write a critical analysis of literature then it is called a literature review. A literature survey is important because it sheds light on a variety of is- sues concerning your research problem (Blanche & Durrheim, 1999). From

the literature surveyed, you will be able to discover what other people have written concerning the problem, the methods they used to study the problem, the sample and the conclusions and recommendations they made for a particular problem. The theoretical knowledge you acquire from the literature review enables you to start your research with confidence and skill.

Learning Tip

- Work from the General to the Specific sources.
- Find background information first, and then use more specific and recent sources.
- Record what you find and where you found it.
- Record the complete citation for each source you find; you may need it again later.

It is a good practice to mark a specific file where you keep all materials (plus some photocopies) related to your research project. In this file you can also keep analytical and interpretative notes about your research. This file is called a re- search journal. Journaling is one of the most effective ways of managing the writing process. It helps you to keep your related literature in one accessible place. You will be required to write your literature review using a specific style. In this module we use the American Psychological Association (APA) style. This is the style you will be expected to use when you are writing your assignment papers as well. We have used the same style in citing sources and writing references for this module.

Learning Tip

There are other styles of citing and referencing literature that have been adopted by educational and research institutions. For example the Harvard style is used in some universities. AVU prefers the APA.

Step 2

- Study the APA writing, citation and referencing style.
- Using the guide lines on citing literature from the reading, identify and write a literature review (600 words) for the problem you selected in step 1 . In the review, make sure you indicate the nature of the problem, how wide spread is the problem, those affected by the problem, the need to study the problem, attempts made by other researchers in solving the problem. Have a minimum of 10 different citations in your literature. Cite according to the APA. It will be good if your citations mainly come from research articles published in international journals.
- Share your review with a course mate and let him/her make useful comments for improving your review. Incorporate the suggestions and write a revised copy. Keep this copy for future use.

After you have read extensively about your research problem then you can start thinking about the likely causes of the problem. You can generate the unanswered questions in your reading. You can do this by formulating hypotheses and/ or research questions.

Hypotheses and research questions

After you have identified your research problem it is essential that you define it in a way that makes it possible for you to investigate it. You do this by forming hypotheses in case of quantitative research or research questions for qualitative re- search.

Hypothesis

A hypothesis is an educated guess about the relationship between variables involved in your research problem. The hypothesis shows the researcher's assumption of the relationship between the independent and dependent variables in quantitative research. The hypothesis helps in directing your research. After collecting and analysing data, the researcher can either reject or retain the hypo- thesis. However you should note that hypotheses are only stated in quantitative research where we can use statistical methods to test them so as establish a cause–effect or correlational relationship among variables.

Research questions

In qualitative research, we use research questions instead of hypotheses, and the objective is to seek plausible answers to the questions posed during the research process. Research questions are issues of concern that a researcher might want to understand or interpret. Research questions guide the research process in qualitative research.

Learning tip

Research questions are sometimes written as statements. In quantitative research, a research question may be the hypothesis that the researcher has written to indicate a connection between the issues she is investigating. We may have both re- search questions and hypotheses in quantitative research. When we do have both, the questions indicate the issues to be investigated while the hypotheses show the connection between the issues. In qualitative research we only use research questions. When stated clearly, the hypotheses you want to test, questions or issues you want to explore is what we call problem definition.

Step 3

- Study the reading on research questions and hypotheses
- Using the ideas from the reading and the literature review you wrote in step 2, form a research question(s) linking your problem to its likely causes (it should be about one sentence).
- Write an alternative hypothesis predicting a possible relationship between the variables you have identified.
- Assume you are ready to study this problem, write 3 objectives for your study reflecting your research questions or hypotheses.
- Write a research topic or title for your problem in not more than 16 words.

Learn tip

- Your research process begins when you state the research question, problem or issue that you want to explore.
- Then you develop a topic. A research topic is a broadly defined subject area .E.g.: students' Perception of the Qualities of Good Mathematics teachers.
- Then you formulate a question. This is a narrower perspective or focus on the topic by asking a series of questions about the topic. E.g.: What are students' Perception of Qualities of Good mathematics teachers?
- Finally you write your title, which includes the major variables or issues that you plan to study. It should also indicate the potential relationship between the variables to be studied. It is easier to get a research title or topic after you have first identified a research problem.

Sampling

A sample is the representative portion of the population from which data will be collected. The sample may be people, a group, an object or text. The sample is selected using specific methods. The methods that you use depend on the research paradigm in which you will operate. In quantitative research, a sample is normally picked using accepted statistical methods based on the laws of probability. Some of the common methods used in probability or quantitative sampling are;

- Simple random sampling
- Cluster sampling
- Systematic sampling
- Volunteer sampling
- Stratified sampling
- Multi-stage sampling

However in qualitative research, a different type of sampling strategies are used. Sampling in qualitative research aims at having cases that will provide data the researcher wants. Therefore qualitative samples are non – probability samples, since the issue of representativeness is not important. The following sampling methods are commonly used; Purposive sampling, Accidental sampling, and Snowball sampling (Miles & Huberman,1994).

Step 4

Study the reading on research paradigms and one on sampling and use those ideas to;

Write an essay (200 words) about the paradigm you have chosen to study the problem you identified in step 1. In the essay indicate why you have chosen that paradigm and the respondents you will use and the method you will use to select them.

Research design

A research design is the strategy that the researcher uses to study the research problem and answer the research question. It provides the glue that holds together the different parts of the research project. It is used to structure the research and think of how all the different parts and processes – samples, measures, treatments, programs, data collection and analysis strategies – work together to ad- dress the central research questions. It helps us answer critical questions under-lying methodology, such as what will we do in our research, how will we do it; and why will we do it in a particular way? Designs can either be Qualitative or quantitative. Quantitative designs are descriptive, correlational or experimental. Descriptive designs aim at exploring what is happening Correlational designs seek to establish relationships while experimental designs explore cause- effect- relationships. Experimental designs can be true experiments or quasi-experiments. A true experiment is one with both the experimental group and the control group. The experimental group is treated with the independent variable and a change is observed and recorded in the dependent variable. A quasi experiment is arranged to explore the effect of the independent variable on the dependent without necessarily having control groups.

You can check the clarity of your research process by asking yourself the questions in the box below,

1. I am studying (what topic?)
2. Because I want to find out (problem/ what/why?)
3. In order to do (what?) (Justification/rationale/why?)
4. By which method (broad approach/ method/how?)

Step 5

Assume that you are now going to study the problem you have identified in the activity above, in 4 paragraphs (maximum 200 words),describe your research design by indicating;

- The paradigm you will follow,
- The sample you will study,
- The data you will collect,
- The instruments you will use,
- What you will do to ensure reliability and validity of data collection process the procedure you will follow in collecting data and how you will analyse your data.

Formative evaluation

1. Write down 4 characteristics of good research problems
2. Mention three common sources of research problems
3. What are the likely sources of literature in your area?
4. What is the purpose of sampling?
5. Mention three qualitative research designs that you know

Learning activity # 3

Title of Learning Activity: **Data collection and analysis**

Summary of the learning activity

In this learning activity you will learn how to Identify appropriate data analysis techniques, Construct appropriate data collection tools, Use both qualitative and quantitative data analysis to analyse research data. You will also learn how to use computer programmes like micro-soft Excel or SPSS to analyse data.

Objectives

By the end of this activity you should be able to;

- Identify appropriate data analysis techniques,
- Construct appropriate data collection tools,
- Use both qualitative and quantitative data analysis to analyse research data. use computer programmes like micro-soft Excel or SPSS to analyse data.

List of relevant readings

Title: Tips for Designing Data-Collection Instruments

Complete reference: http://www.albertahealthservices.ca/assets/info/res/mhr/if-res-mhr-eval-resources-designing-instruments.pdf

Date retrieved: 16/04/2016

Description

This hand-out provides details on how to design your own questions and tips for administering each of the techniques. There may be instances where questions have been designed and researched and shown to measure what it intends to measure (valid) and does so consistently (reliable). When these questions exist, it is usually worth contacting the author and asking permission to use them.

Key concepts

Data: A collection of information, in the form of numerical measures of respondents' attributes (in quantitative research) or , texts, voices, or images (in qualitative research).

Data collection: Assembling data required to answer the research question from respondents, using instruments.

Item: A question or statement in a test or questionnaire to which a research participant is expected to give a response.

Qualitative analysis: Using a variety of techniques like, content analysis, causal matrix networks to put meaning into qualitative data.

Statistical analysis: The summarisation and analysis of numerical data.

Detailed description of the activity

Data collection methods

You need data about the research problem, which you interpret so as to understand and get solutions to your research problem. The data you collect can be numerical information e.g. the family type of your students, number of times a student has been absent in a semester. In qualitative research, data can be in text form, such as newspaper articles written on feminism, or images such as graffiti that is written on the walls of toilets of male students. This data is collected using appropriate tools (Lokesh Koul ,1998). Tools can be questions on a sheet that your respondents have to answer for themselves or that they may answer as you write the responses for them. Sometimes, tools can be gargets that are used to capture or record voices, happenings, events, like cameras, recorders etc. The nature of tools that you use to collect your data depends on the kind of data you will want to collect and the nature of assumptions that you have made about this data (paradigms).

These tools may be used in a certain way to collect data. They may be used through face to face interaction (interview), questions answered on a piece of paper or measurements (experiments). Data can be collected by interviewing, doing an experiment or making field observations. The strategies used to collect data are called data collection methods. Tools like interview guides, questionnaires and observation guides, cameras, tape recorder can be used to collect data. Data collection methods and tools can either be quantitative or qualitative. Qualitative data collection methods allow the subjects being studied to give much 'richer' responses to questions put to them by the researcher, and may give valuable insights which might have been missed by any other method. In qualitative research, the data are narrative descriptions and observations (Seldman, 1991). In quantitative research, the data are numbers and measurements.

Step 1

- Study the readings on Tips for constructing data collection instruments and research ethics (Reading # 3, #4 and #5)
- Use the ideas you have got from the readings to construct a ten question, open –ended questionnaire to study the problem you identified in activity 1.
- In an essay of about 150 words explain the procedure that you followed in constructing the instrument. In the essay, also indicate what you will do to ensure that your instrument would collect reliable and valid information.
- Identify one willing teacher and let her/him complete the questionnaire. Request the teacher to suggest any improvements that can be made on the writing of the questionnaire, such as the clarity, content, structure, relevancy of questions in the questionnaire. And any omissions and additions that can be made.
- Incorporate the changes that have been suggested and write a revised version.
- On the questionnaire, write an introductory paragraph, indicating the ethical standards that you will follow.
- Using the revised questionnaire, systematically select 10 other teachers to complete the questionnaire and keep the data for step 2. (You need to consider, gender, experience, and nature of school in your sampling in the selection of these teachers).
- Transform the questionnaire into an interview guide and interview 5 willing teachers. You may record the interview and later transcribe it or you may just write the responses on the interview schedule. Keep the responses.

Let us now see how you can make meaning out of the data you collected.

DATA ANALYSIS

Quantitative data analysis

Quantitative measurements can be used to present social and individual objects both tangible and intangible. Statistics is then used to summarize, present and analyse data. The first step in the use of statistical analysis is data organization. Numbers are assigned in such a way that they can represent attributes, constructs and behaviour (Best & Kahn 1986).

Data Organization

After collecting your data in the form of figures, text or responses, you will need to interpret using descriptive statistics if you were doing quantitative research. Statistics is a tool that can help you in data presentation, analysis and interpretation. You can use tables, frequency distributions, graphs or charts in organizing data;

Graphical representation of Data

Tables, histograms, polygons, pie charts are commonly used graphics to present quantitative data. A Histogram is a graphic representation of a frequency distribution. An example is presented in figure 3.

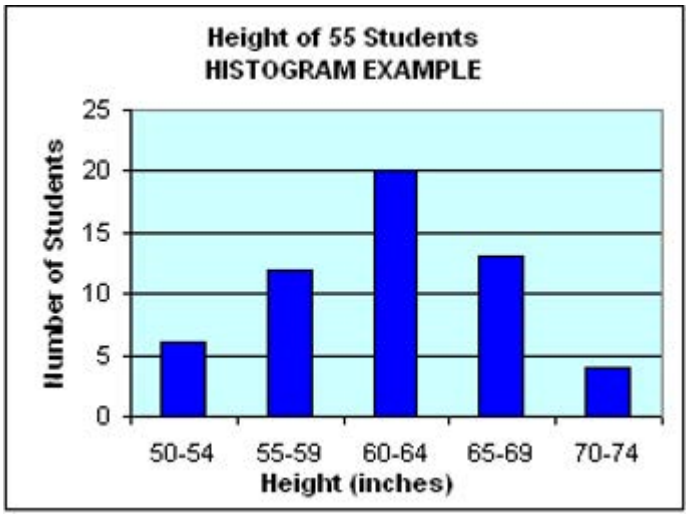

Figure 3 : Sample Histogram

A Frequency polygon is a line graph or a graphical representation of a frequency distribution. You plot frequency (y-axis) against mid points (x-axis). An example is presented in figure 4

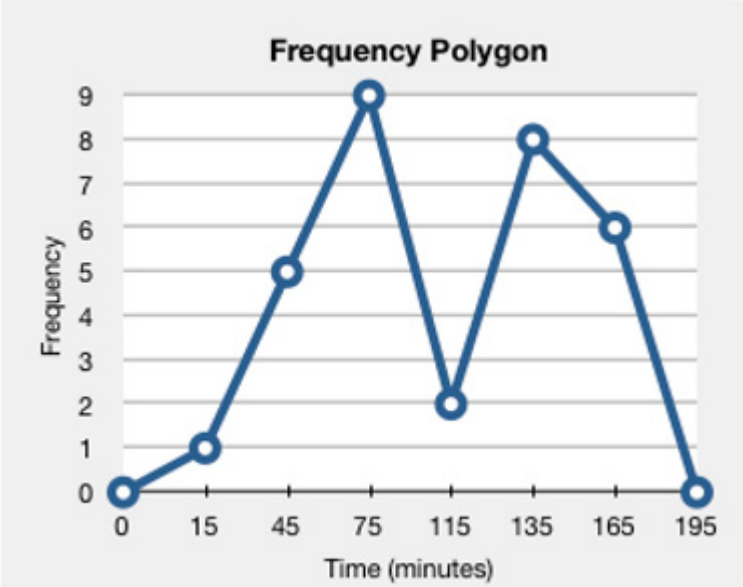

Figure 4: Frequency polygon

Source: https://whites-geometry-wiki.wikispaces.com/6siesco

Measurers of central tendency

After you have put your data in a frequency distribution, you can further use measures of central tendency to have a better interpretation of your data. Measures of central tendency are

estimates of the centre most score in a distribution- they give you an average, single value that explains the characteristics of your data. The most common measurers of central tendency are: Arithmetic means, (Mean), median and mode.

Measures of Variability

The measures of central tendency we have looked at (mean, median, mode) give us a single value for the whole group. But measures of variability show us the degree of variation from the central score, usually the mean. They express how data is spread from the centre in either direction. They help to indicate how closely or widely distributed the data is around the centre. The commonly used measures of variability are range, variance and standard deviation. You should report measures of variability along with measures of central tendency in order to make your data interpretation more meaningful. The range is simply the difference between the values of the lowest and highest observation variables. The range of the data is given by (highest value – lowest value) = range. Standard Deviation (s or) is considered to be the best measure of variability because it takes into account the distance that separates each score from the mean. It can measure the extent to which scores (data) tends to deviate from the mean. It's therefore reported along with the mean.

Measures of Relationships

Teachers are always interested in relationships between variables; we may be interested in determining if there is a relationship between performance in Mathematics and Geography. If it exists, what is its nature? We may even go further to determine whether one variable is the cause of the other. Statistical procedures that attempt to establish the nature and magnitude of relationships among variables are referred to as measurers of relationships. The relationships are expressed as a correlation coefficient which is represented by the letter r. Correlation coefficient values lie between –1 and +1. Correlation coefficients can also be reported in terms of direction. This direction can be positive or negative. A positive direction indicates that the variables are directly related; such that as one increases, the other also increases. E.g.;

- Intelligence and academic performance
- Distance and oil consumption

A negative correlation, on the other hand indicates that the variables are inversely correlated such that as one increases the other decreases. Time spent watching TV and academic performances are examples of negatively correlated variables. Certain variables have no relationship, e.g. age and height or kindness and weight. Correlations can be calculated using either Pearson product moment or spearman correlation formulas.

Measures of relative positions

Some time we might be interested in knowing where a student or given group of students stand in relation to the whole class or school. We could also want to know how our school compares with other schools in the region in rates of passing in a regional or national examination. We can acquire this knowledge if we do calculate measures of relative position. The percentiles, quartiles, and deciles are the commonly used measures of relative position in

educational research. A percentile is a point on the score scale below which a given per cent of the cases lie. Therefore, in percentiles, the scores are divided into 100 equal parts each referred to as percentile or centile. Therefore P20 will mean a point on the score scale below which 20 per cent of the cases in a distribution lie. A quartile is a point on a distribution (score) below which a quarter of the cases lie. Quartiles divide the distribution into 4 quarters, the 1st, 2nd, 3rd, and 4th quartiles. A decile is the point on the distribution below which given deciles of cases lie. Deciles divide scores into 10 equal parts. D4 is a score in the distribution below which 4 deciles of scores fall. We can compute quartiles, deciles and percentiles by adopting the formula for computing the median which you have already met under measures of central tendencies.

Learning tip

You can use a calculator or a computer to analyse your data. Statistical data analysis programs like, STATISTICA, SPSS, SAS, EPI – INFO and EXCEL can be used to do this. You can approach any researcher or statistician who knows how to use these programs to help you analyse your data. Some qualitative data analysis programmes like en-vivo have been introduced. For a detailed study of qualitative computer data analysis read Weitzman and Miles, (1995).

Qualitative Data Analysis

Qualitative analysis

This is using methods of data collection and analysis that are not quantitative. It aims at exploration, description and interpretation of reality as experienced by the respondents. Qualitative data analysis focuses on understanding, rather than predicting or controlling. Some of these techniques may be used to analyse data qualitatively; ethnography, narrative analysis, discourse analysis, textual analysis, content analysis, analysis of meaning and frequency analysis. Qualitative data is collected from in-depth interviews, structured observation, naturalistic and participant observation, text, images and artefacts.

This is the data analysis procedure that is normally followed in qualitative analysis (Denzin & Zincoln, 1994):

1. Familiarization with and Immersion into data

2. Inducing themes in data

3. Coding data

4. Elaboration of data

5. Interpretation and checking of data

6. Write a good story of your findings

The above procedure is achieved when the researcher keeps on asking and re-asking the following questions (Wolcott, 1994):

- What patterns and common themes emerge in responses dealing with specific items? How do these patterns help to illuminate the broader study question(s)?

- Are there any deviations from these patterns? If yes, are there any factors that might explain these atypical responses?
- What interesting stories emerge from the responses? How can these stories help to illuminate the broader study question(s)?
- Do any of these patterns or findings suggest that additional data may need to be collected? Do any of the study questions need to be revised?
- Do the patterns that emerge corroborate the findings of any corresponding qualitative analyses that have been conducted? If not, what might explain these discrepancies?

Step 2

- Study the readings on statistical and qualitative data analysis (readings #11, #12, #14) . Pay special attention on how to use SPSS and excel to create frequency tables, histograms and to calculate measures of central tendency, variability, relative position and relationships. Also study the use of data matrices in analysing and presenting qualitative data.
- Using the ideas from the reading, analyse data from the questionnaires that you collected, using SPSS (or excel).
- Using SPSS, or Excel, create a frequency table for each of the first 5 questions in your questionnaire. In this table indicate the response (column 1, the number of times the response was given (column 2 and the percentage taken by this response. Each of your tables should look like the one below.

Responses	Frequency	Percentage
1		
2		
3		
Total		100

- In the next five questions, use SPSS or Excel to draw bar graphs of your data.
- Give brief highlights indicating major findings below each table and graph. You may want to place your tables and graphs under the sub titles you used in your literature review in activity 2, step 2.
- Using the guidelines on qualitative data analysis you have learnt, study the interview responses also. Identify the major issues or themes emerging from the interview and use data matrices to present your data. Write your findings using the themes you identified from the literature. You may use new themes as well.

- Write a detailed discussion (in about 300 words) of your study. In the discussion, interpret your results against the purpose and objectives of the study. Show theoretical expectations and explain any deviations. Refer to literature and cite it properly. Show how findings agree or disagree with the literature you cited in step 2, activity 2. Draw some conclusions on your findings and expectations and implications.

Formative evaluation

1. What is the difference between an interview guide and a questionnaire?
2. What common types of interviews can the researcher use to collect data?
3. How do we construct questionnaires?
4. What disadvantages are involved in using questionnaires to collect data?
5. What advantages are involved in using interview guides to collect data?
6. Give the major difference between qualitative and quantitate data analysis

Learning activity # 4

Title of Learning Activity: **Research Project**

Summary of the learning activity

In this activity you will learn how to write good research proposals, evaluate your own proposal, respect copyright issues when you are writing the proposal, incorporate ethical issues in your proposal, do a pilot study to test the validity, reliability of your research design and instruments and finally write a good research report. In this activity you will put together everything we have learnt in the previous units. You will also critically study a research article and ensure whether it has all the necessary elements.

Objectives

- By the end of this activity you should be able to;
- write effective research proposals,
- evaluate your own proposal,
- comply to copyright issues when you are writing the proposal,
- incorporate ethical issues in your proposal,
- do a pilot study to test the validity, reliability of your research design and instruments and finally
- write an effective research report
- Critically study a research article and ensure that all the necessary elements.

Key words

Theory Hypothesis

Research question

Research design Sampling

Research proposal

Research report

List of relevant resources

- A computer with internet connection to access online open resources recommended
- Hand outs provided by the trainer

Detailed description of the activity

You are going to use research concepts and skills you have learned in previous units to write research proposals and reports and evaluate these. This activity will help you move beyond the level of mere understanding to application and analysis level.

The research proposal

This is a written document outlining a proposed research project. It is a plan that you will follow when you are doing your study (Somekh &Lewin 2005). It can be compared to an architectural plan that builders use while building a house. What you write in your plan comes from the ideas you generate during the research process. The proposal describes the problem and its importance, and gives a detailed account of the methods that will be used and why they are appropriate. You need to write your proposal carefully and diligently because your success in research depends very much on it. A proposal is a scientific document and therefore the writer should adhere to the scientific style of writing. Other reasons why proposals are written is to ask for funding of your research project, as requirement to be accepted in a program of study or showing how you plan to study a problem in a school or company. In addition, a proposal will give you guidance as you conduct the research and will act as a reference for the supervisor to provide assistance to you during the research process.

Structure of a research proposal

Here is an outline of the main components of a research proposal;

Title Page

All books you have read so far have a cover to explain the title, the writers and in some cases the publishers. The same applies to the proposal. The first page that is called the title page has the title of the proposed research, the names and affiliations of the researcher and the institution to which the proposal will be submitted, the year and month of submission. However remember that a title is usually not a full sentence, but just a phrase constructed from the key terms in the project.

General introduction

After the cover/title page, the next section is the introduction. This forms chapter one of your proposal and it has the following divisions.

Background to the problem

This is like an introduction to the problem. In this division, you explain the roots of the problem, how wide spread it is and who are affected by the problem. You finally show why you think it is important to undertake a study of the problem. This background helps the readers have a picture of what you want to study.

Statement of the problem

You are now familiar with the meaning of the problem. But in this division you need to state in a few sentences what you are actually going to study. It is true that you have said much about the problem of study in the background, but it is beneficial to give a summary of it under this part. The statement of the problem clearly shows your goals. The statement shows what is lacking, what is not known or gaps in literature. Short and brief sentences should be used when stating the problem and they should not be more than a paragraph long.

Learning tip

It is now a common practice for researchers not to write out a problem statement as a separate section of chapter one. The problem emerges towards the end of the background and it is called a motivation/ need for the study.

Purpose of the study

This is the single aim of your study. It's the one reason why you want to carry out the study, showing what you will do about the problem.

Study objectives

Teachers, normally write down lesson objectives to help them evaluate their teaching and learning of the pupils. Objectives have a similar purpose in research. They help the researcher to understand what he will do in the process of research and evaluate whether he has achieved his goals at the end of the research process. Objectives are the actions that a researcher will perform to achieve the purpose of the study. When writing down research objectives you need to indicate what will be learnt, information that will be gained and what will be measured or described. Always use action words, such as;

- To identify
- To measure
- To verify

Your objectives should be specific, measurable and numbered.

Significance of the study

This is a brief explanation of how your findings will be used to improve the quality of education, and social life. You should show how the society, educational administrators, the ministry and government will benefit from your findings. Under, the significance of the study, you show the value of your study. So you should carefully think about how you write them down. Sponsors of researches normally study this section carefully before they decide to fund a project.

Scope of the study

In the scope, the researcher explains the geographical and conceptual limitations of his study so that he is able to satisfactorily carry out the research. Because of time and financial limitations, the researcher is sometimes not able to study all the possible units of the research problem; therefore he only studies a few sample. In this section, the researcher explains why he has chosen a particular sample and the issues that he is to study.

Ethical issues

Here you explain the ethical issues affecting your research and how you plan to address them.

Definition of terms

The research proposal is sometimes read by people who have little knowledge in your area of research, so you need to define the unusual terms and concepts that can be misunderstood or misinterpreted. You define these in the way you will use them. However it's now a common practice to define terms as you go along in the background- so you then do not have this section.

Literature Review

We have already discussed the meaning and importance of literature review in unit 2. I am sure you can appreciate why literature review should be a preliminary step in the research process. In the literature review the researcher gives the history, theory about the problem objective by objective. A logical argument is given for each objective by answering the following questions: who did the study, when (year), what (finding), where (place), How (methods) and whom (respondents). This technique called the 5WH is used in the following two ways;

(I) Quotations (ii) Paraphrasing

Research questions and hypotheses

This is normally the last section of chapter two. If the researcher is doing a qualitative research, he should clearly state the research questions. For a quantitative study the researcher should clearly state the hypotheses.

Methodology

This is the third chapter of your research proposal. In this section you describe your research design, sample data collection Instruments, procedure and data analysis strategies. Methodology has the following parts:

Sample

A sample is the representative portion of the population from which data will be collected. The sample is normally picked using the accepted statistical methods if the study is quantitative and its called a probability sample.

Data collection instruments

You need to explain clearly how you will collect the data and the type of instruments that you will use. If you intend to use a questionnaire, interview guide or observation guide, explain how they will appear and give reasons why you plan to use them. Clearly show what you will measure using these instruments. Will you measure attitudes, feelings, and opinions? If the instruments are standardized, indicate their validity and reliabilities.

Data Analysis

In this part of chapter three, you explain the methods you will use in organizing, analysing and

interpreting your data. Indicate the tools e.g. computer, calculators that you will use and the kind of analysis that will be employed. Show whether you will use frequency tables, measures of central tendency, tests of correlation or inferential tests of significance.

Reference section

This is the last section of the research proposal. It contains the list of books, magazines, journals, and other literature you have cited. The reference list is written in alphabetical order and only books cited in literature are written. In case you write down books you have not cited but only read this will be called a bibliography. Bibliographies are only written in published books but not in research.

Appendices

This has the budget of the research in case you are to be funded by a certain organization and a sample of the instrument you will use in data collection. The time frame is also included here. Also maps and other important documents used in research may be included here.

EVALUATING RESEARCH PROPOSALS

After writing your proposal, try to ascertain whether it is of good quality by answering yes to all the questions in the table below.

Checklist Items			
Is the title precise, clear, meaningful and appropriate?			
Is it clear for what reason (s) the proposal is submitted			
Is it clear what the research problem is?			
Have you described the context of your research problem?			
Why is the project important? How is it relevant?			
Is it clear what research question (questions) to be investigated			
Is literature cited to provide			
Is a general purpose stated? (NB congruently to the title)			
Are specific objectives stated? (One objective for every research question)			
Are the research objectives provided clearly and concisely?			

Do the objectives match the research questions? (The line of reasoning should flow from the background, through the problem statements into the aims.)			
Are data Measuring instruments indicated appropriate?			
Is the Population / sample clearly indicated?			
Are Data collection procedures clear and appropriate?			
Have you indicted the Data processing procedures?			
Are the chapters identified clearly and do they indicate a logical flow to the identified title and problem statement?			
Is the technical quality of the document of the required standard? (General structure, writing style, numbering of headings, references, reference list)			
Are project costs and budgets indicated and explained?			
Is a time frame considered for the study?			

The more ticks you have the higher the quality of your proposal. It is a good practice to evaluate your proposal before you give it to the supervisor. This evaluation may remind you of important aspects that you might have neglected.

A pilot study

After your proposal has been approved, then you are ready to go to the field. The first activity done in the field by most quantitative researchers is to test the quality of their instruments. They pick a small sample of respondents to complete the instrument. They might be given opportunity to comment on the clarity and difficulty level of items. There after data collected is used to calculate and improve the reliability and validity of the instruments. Statistical methods are used to do this in quantitative research.

Research report

A research report describes how the problem was approached and analysed and presents a discussion of the findings and the implications of these findings. A report also presents a complete detailed account of all experiences, and thinking that the research went through in doing the study. The experiences involve:

1. Problem identification and definition.
2. Formulation of hypothesis or research questions
3. Collection and analysis of data.
4. Discussion and drawing out of conclusions.

Writing in reported speech the researcher adds to the proposal, the findings section and the discussion and conclusions section to complete the report.

Step 3

- Study the reading titled "Attitudes of college students toward contraceptives: a consideration of gender differences" published in college student journal.
- Answer the questions below;

A) Research problem

i) What is the major research problem identified in the study?

ii) What is the importance of the study? What is the justification for conducting the study?

iii) What is the purpose of the study?

iv) What is (are) the research question(s), objective(s) and/or hypothesis?

B) Measurement

i) What are the main variables of the study?

ii) Are there independent and dependant variables in the study? If yes, what are they?

iii) How are the variables of the study measured?

C) Research design

i) What specific research design did the author use?

ii) How is this design appropriate for the purpose of the study? Comment briefly.

D) Sampling

i) What is the population that the author wanted to study?

ii) What type of sampling technique did he/she use?

iii) What are the implications of this sampling technique for the research?

E) Data collection

i) What data collection method did the researcher use?

ii) What are advantages and disadvantages of this specific data collection method?

F) Data analysis

i) How was the data analysed?

G) Results

i. What are the major results/findings of the study?

ii. How do the results of the research fit with the original research question(s), objective(s) and hypothesis?

H) Implications of the findings

i. What conclusions did the author reach?

ii. In your opinion, what is/are the significance(s) of the findings for educational knowledge and practice?

Answer guidelines

- Make sure you answer all the questions in sufficient detail
- Paraphrase the points in the article, but do not directly quote.
- Your answer to each question should be a short paragraph of between 50 to 100 words.

Formative Assessment

Use the structure for evaluating research proposals above and write a 300 word evaluation report of the above research project, indicating the shortfalls and how they could have been bridged.

XV. Synthesis of the Module

In this module you have learnt how to conduct educational research in order to find to find solutions to educational problems. The module has 4 units each with one learning activity. In unit 1 you have learnt major research concepts and paradigms. You have done readings and completed activities to enable you master the content. In unit 2 you learnt how to identify researchable problems and prepare to conduct research. You can identify research problems formulate clear hypotheses and questions, search and compile and write relevant literature following the APA citing and referencing style. You also learnt how to select designs and study samples appropriate to your research question. In unit 3, you have learnt how to construct data collection instruments to collect both qualitative and quantitative data. You can also now analyse research data using either qualitative or quantitative techniques. You are able to use computer data analysis programs like excel and SPSS to analyse your data In the last unit you have learnt how to write research proposals, conduct a pilot study to test the quality of test items, the reliability and validity of your instruments. You also learnt how to write project reports. The skills you have acquired will help you to complete your course work assignments successfully and more importantly you are now able to add new knowledge to the theory and practice of education through research.

XV. Summative evaluation

Provide a critique of the research proposal presented below and design a qualitative study to investigate the same research question.

Title: Student Research Project

Summary

In order to assess your mastery of the concepts and skills that you learnt in this module, you will compile a research project report. Following the outline above write a research report of about 10–15 page on the problem you identified in learning activity 2. You will do this by compiling and recomposing the short essays you have written in activities 2 and 3.

The format of your report should conform to the format below.

- Preliminary Pages
- Title page
- Abstract
- Table of contents
- List of figures
- List of tables
- Introduction
- Background of the problem
- Statement of the problem
- Significance of the problem
- Objectives of the study
- Research questions and hypothesis
- Definition of terms
- Literature review
- Methodology
    - Research design
    - Population
    - Sample and sampling technique
    - Instruments
    - Data collection

- Data analysis techniques
- Limitation of the study

- Results and Discussion
- Presentation and analysis of data
- Interpretation of findings
- Conclusions and recommendations
- Summary of results
- Conclusions
- Implications of the study findings
- Recommendations

The following is the typing format you should follow in your writing of the research report.

- Pages: 25 – 30
- Font: size: 12, type: Times New Roman
- Spacing: 1.5
- Text: on 8 1/2" x 11" paper with 1 inch margins, single sided
- Start each new section on a new page.

How to submit

You are required to submit your work on or before the date your instructor specifies as an email attachment.

Answer key

Your instructor can use this marking guide to evaluate the quality of your re- search report. You may also use the guide to insure that your report has all the necessary elements before you turn it in to your Instructor.

Preliminary section (10 marks)

- A precise, clear, meaningful title and appropriate
- Clear table of contents
- Abstract (indicating in not more than 300 words, the purpose of the study, the sample, sampling strategy, instruments, data analysis methods, major findings, major recommendations).
- List of table or figures

Chapter one: Introduction (20 marks)

- Background of the problem
- Clear research problem
- Context of your research problem described
- Research question (questions) to be investigated clear
- Statement of the problem
- Purpose of the study
- Clear, specific Objectives
- Significance of the problem
- Research questions and/or hypothesis indicated
- Definition of terms given

Chapter two: Literature review (10 Marks)

Literature cited according to APA. More than 10 Citations, related to problem, done objective by objective.

Chapter three (15 marks)

- Data measuring instruments indicated and appropriate
- Population/sample clearly indicated
- Data collection procedures clear and appropriate
- Data processing procedures indicted

Chapter four: Data Presentation and Analysis (20 marks)

- Data correctly presented and analysed
- Data analysis methods appropriate
- Interpretation of findings correctly done
- Highlights of findings given

Chapter Five: Discussion, Conclusion, Recommendations (15 marks)

- Discussion made by indicating Summary of results and relating them to literature.
- Conclusions related to findings and objectives
- Implications of the study findings given
- Recommendations, related to findings and are feasible

Technical aspects of report (10 Marks)

- Chapters identified clearly, correctly named and indicate a logical flow from the identified title and problem statement, to recommendations
- The general structure, writing style, numbering of headings, references, reference list done correctly
- Appendices attached

Total Marks = 100 Marks

XVI. References

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XVII Appendices

This glossary is intended to assist you in understanding commonly used terms and concepts when reading, interpreting, and evaluating scholarly research in the social sciences. Also included are general words and phrases defined within the context of how they apply to research in the social and behavioral sciences.

Accuracy	A term used in survey research to refer to the match between the target population and the sample.
Aggregate	A total created from smaller units. For instance, the population of a county is an aggregate of the populations of the cities, rural areas, etc. that comprise the county. As a verb, it refers to total data from smaller units into a large unit.
ANCOVA (Analysis of Co-Variance)	Same method as ANOVA, but analyzes differences between dependent variables.
Anonymity	A research condition in which no one, including the researcher, knows the identities of research participants.
ANOVA (Analysis of Variance)	A method of statistical analysis broadly applicable to a number of research designs, used to determine differences among the means of two or more groups on a variable. The independent variables are usually nominal, and the dependent variable is usual an interval.
Baseline	A control measurement carried out before an experimental treatment.
Bias	A loss of balance and accuracy in the use of research methods. It can appear in research via the sampling frame, random sampling, or non-response. It can also occur at other stages in research, such as while interviewing, in the design of questions, or in the way data are analyzed and presented. Bias means that the research findings will not be representative of, or generalizable to, a wider population.
Case Study	The collection and presentation of detailed information about a particular participant or small group, frequently including the accounts of subjects themselves.
Confidence Interval	The range around a numeric statistical value obtained from a sample, within which the actual, corresponding value for the population is likely to fall, at a given level of probability (Alreck, 444).

Confidentiality	A research condition in which no one except the researcher(s) knows the identities of the participants in a study. It refers to the treatment of information that a participant has disclosed to the researcher in a relationship of trust and with the expectation that it will not be revealed to others in ways that violate the original consent agreement, unless permission is granted by the participant.
Confounding Variable	An unforeseen, and unaccounted-for variable that jeopardizes reliability and validity of an experiment's outcome.
Construct Validity	Seeks an agreement between a theoretical concept and a specific measuring device, such as observation.
Content Validity	The extent to which a measurement reflects the specific intended domain of content (Carmines & Zeller, 1991, p.20).
Control Group	A group in an experiment that receives not treatment in order to compare the treated group against a norm.
Correlation	A common statistical analysis, usually abbreviated as r, that measures the degree of relationship between pairs of interval variables in a sample. The range of correlation is from -1.00 to zero to +1.00. 2) A non-cause and effect relationship between two variables.
Covariate	A product of the correlation of two related variables times their standard deviations. Used in true experiments to measure the difference of treatment between them.
Credibility	A researcher's ability to demonstrate that the object of a study is accurately identified and described, based on the way in which the study was conducted
Criterion Related Validity	Used to demonstrate the accuracy of a measuring procedure by comparing it with another procedure which has been demonstrated to be valid; also referred to as instrumental validity.
Data	Recorded observations, usually in numeric or textual form
Dependent Variable	A variable that receives stimulus and measured for the effect the treatment has had upon it.

Experiment	Experimental Research A researcher working within this methodology creates an environment in which to observe and interpret the results of a research question. A key element in experimental research is that participants in a study are randomly assigned to groups. In an attempt to create a causal model (i.e., to discover the causal origin of a particular phenomenon), groups are treated differently and measurements are conducted to determine if different treatments appear to lead to different effects.
External Validity	The extent to which the results of a study aregeneralizable or transferable. See also validity
Face Validity	How a measure or procedure appears.
Factor Analysis	A statistical test that explores relationships among data. The test explores which variables in a data set are most related to each other. In a carefully constructed survey, for example, factor analysis can yield information on patterns of responses, not simply data on a single response. Larger tendencies may then be interpreted, indicating behavior trends rather than simply responses to specific questions.
Generalizability	The extent to which research findings and conclusions from a study conducted on a sample population can be applied to the population at large.
Hypothesis	A tentative explanation based on theory to predict a causal relationship between variables.
Independent Variable	A variable that is part of the situation that exist from which originates the stimulus given to a dependent variable. Includes treatment, state of variable, such as age, size, weight, etc.
Inductive	A form of reasoning in which a generalized conclusion is formulated from particular instances
Inductive analysis	A form of analysis based on inductive reasoning; a researcher using inductive analysis starts with answers, but forms questions throughout the research process.
Internal Consistency	The extent to which all questions or items assess the same characteristic, skill, or quality.

Internal Validity	(1) The rigor with which the study was conducted (e.g., the study's design, the care taken to conduct measurements, and decisions concerning what was and wasn't measured) and (2) the extent to which the designers of a study have taken into account alternative explanations for any causal relationships they explore (Huitt, 1998). In studies that do not explore causal relationships, only the first of these definitions should be considered when assessing internal validity. See also validity.
Interviews	A research tool in which a researcher asks questions of participants; interviews are often audio- or video-taped for later transcription and analysis.
Mean	The average score within a distribution.
Median	The center score in a distribution.
Mode	The most frequent score in a distribution.
Normal distribution	A normal frequency distribution representing the probability that a majority of randomly selected members of a population will fall within the middle of the distribution. Represented by the bell curve.
Ordinal Variable	A variable in which the order of data points can be determined but not the distance between data points, e.g., letter grades
Parameter	A coefficient or value for the population that corresponds to a particular statistic from a sample and is often inferred from the sample.
Population	The target group under investigation, as in all students enrolled in first-year composition courses taught in traditional classrooms. The population is the entire set under consideration. Samples are drawn from populations.
Precision	In survey research, the tightness of the confidence limits.
Probability	The chance that a phenomenon has a of occurring randomly. As a statistical measure, it shown as p (the "p" factor).
Qualitative Research	Empirical research in which the researcher explores relationships using textual, rather than quantitative data. Case study, observation, and ethnography are considered forms of qualitative research. Results are not usually considered generalizable, but are often transferable.

Quasi-experiment	Similar to true experiments. Have subjects, treatment, etc., but uses nonrandomized groups. Incorporates interpretation and transferability in order to compensate for lack of control of variables.
Random sampling	Process used in research to draw a sample of a population strictly by chance, yielding no discernible pattern beyond chance. Random sampling can be accomplished by first numbering the population, then selecting the sample according to a table of random numbers or using a random-number computer generator. The sample is said to be random because there is no regular or discernible pattern or order. Random sample selection is used under the assumption that sufficiently large samples assigned randomly will exhibit a distribution comparable to that of the population from which the sample is drawn.
Range	The difference between the highest and lowest scores in a distribution.
Reliability	The extent to which a measure, procedure or instrument yields the same result on repeated trials.
Response Rate	In survey research, the actual percentage of questionnaires completed and returned.
Rhetorical Inquiry	"entails…1) identifying a motivational concern, 2) posing questions, 3) engaging in a heuristic search (which in composition studies has often occurred by probing other fields), 4) creating a new theory or hypotheses, and 5) justifying the theory" (Lauer and Asher, 1988, p. 5)
Rigor	Degree to which research methods are scrupulously and meticulously carried out in order to recognize important influences occurring in an experiment.
Sampling Error	The degree to which the results from the sample deviate from those that would be obtained from the entire population, because of random error in the selection of respondent and the corresponding reduction in reliability (Alreck, 454).

XVIII. Authors of the Module

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